UTP ATTENDANCE SYSTEM ON MOBILE PHONE

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by

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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the

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Approved by,

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JANUARY 2014

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or person.

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(MUHAMMAD HANIS BIN KAMARUDIN)

ABSTRACT

Universiti Teknologi PETRONAS is a private university in Malaysia that offer higher-level education to produce well-rounded graduate. Hence, in order to reach the objective as well as to ensure that all students get benefits from all the knowledge provided here, students are compulsory to attend at least 80 percent (80%) of the class if the students want to pass in every course offered. Nevertheless, since UTP was establish from 1997, manual attendance tracking was implemented until now and authors found that there are a lot of disadvantages of that.

Therefore, the objective of study is to replace the manual system of tracking student's attendance with fully automate student attendance system. Other than that, the other objective of project is to use the new technology as the main core in the system. The target technology for this project is Bluetooth technology and Android system.

Some of the problems that have been discovered by author are students tend to cheat by sign on behalf of their absent friends and disruption of lecture session while distribution of attendance sheet from one to another. In order to solve the problem, author has come out with a proposed idea to create a fully automate system that able to track the attendance system just by using Bluetooth sensor connected to lecturer smartphone. Some scopes that need to cover by author to build the system are the interaction between student and lecturer. Other scope is system is developing for mobile apps and Bluetooth technology. Besides, Bluetooth technology also need for more enhancements to connect and send data from non-Android to Android devices. Moreover, the system must have the security and safety features that able to prevent student to commit any cheating.

ACKNOWLEDGEMENT

First and foremost, I would like to thank Allah S.W.T for the blessing that He has given to me in order of my completion of this final year project. Without His blessings, I don't think that I would be able to achieve all the things that I had achieved in the long journey of completing my final year project.

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Last but not least, I would like to sincerely apologies if I have accidentally make mistakes and hurt anyone in completing the final year project.

Thank you.

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Abbreviations and Nomenclatures

UTP	Universiti Teknologi PETRONAS
RFID	Radio Frequency Identification
NFC	Near Field Communication
IRC	Information Resource Center

CHAPTER 1
INTRODUCTION

1.1. Background of Study

Majority of higher learning institution nowadays had established online tracking system for student attendance in conjunction of new digital era (Lewis, 2013). This is due to ensure that students attend and participate all the compulsory lecture sessions. However, Universiti Teknologi PETRONAS still using the old and manual system that need lecturers get the signature of the students in every session in a piece of paper. This system seems to be not too effective and efficient as there are a lot of flaws and issue upraised by UTP community (Bakar, 2009).

In this digital era, smartphones are no more luxury symbol but it is become trends where majority of Gen Y people own smartphones. Therefore, smartphone industry had become sunrise business for all smartphones producers. Android, Symbian, Apple and Microsoft are struggling to win the competitive advantage in the industry.

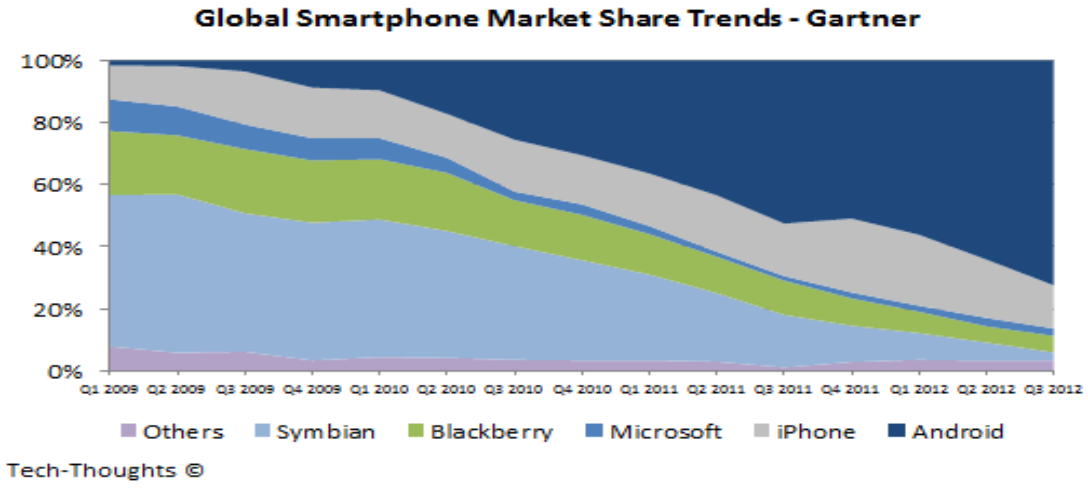

Figure 1.1: Global Smartphone Market Share

The chart above shows Gartner's global market shares figures for the last three years. It clearly shows that Android platform has made most of its gains at the expense of Nokia's Symbian platform and Android has taken away market share from iPhone as well in 2012. This chart proves that Android has the highest number of user worldwide nowadays.

Bluetooth is a wireless technology standard that allows two or more parties exchanging data over the short distance. It is widely used as a medium for 2 users to exchange the information and data via radio wave transmission. Compared to Wi-Fi, Bluetooth technology is more simple to use, low cost, can be used to connect up to seven devices at a time and it is easy to switch between devices or find and connect to any devices.

Thus, the writer has proposed on developing a mobile based on Android application to overcome the problem with a few of enhancement and functionality since there were some deficiencies need to be improve especially on Bluetooth technology in the previous Android Attendance System.

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1.2. Problem Statement

According to Peiris et. Al (2010), there was a lot of problems with the manual students' attendance tracking system. One of them is manual attendance system give some **disturbance to both lecturer and students**. The current practice of getting attendance of the students is by distributing the attendance sheet among the students. First, lecturer will give the paper to the front student, and then she/he will pass the sheet to his/her friend who are seating besides. Then the process will continue until all students in that particular lecture session get the sheet and put their signature on that paper. Therefore, when the sheet arrives at a particular student, the student will lose his/her attention towards the lecturer in front. As the result of that scenario, that particular student might lose some important point from their lecturers while searching their name and put signature on the attendance sheet.

Other than that, there is also possibility to **misplace the attendance sheet** by the lecturer. Usually, the attendance sheet is just a piece of paper that printed by the lecturer and lecturer will bring along the sheet with other study materials to class. However, sometimes the lecturers tend to mix up the attendance sheet and other papers and finally he/she hard to find the attendance sheet. Hence, lectures may lose some of important data of the students' attendance and this may affect barred status of some students.

The other issue that related to the manual attendance system is **students tend to sign on behalf of their absence friends in lecture session** (Budi, 2009). Most of the misconduct cases will involve somebody else to put the signatures for friends. Of course this can be avoided only if the teacher or lecturer may spare their time to check for the actual presence of the students, which probably may disturb the effective learning process.

From previous project, "**Development of "UTP Attendance System" by Using Android Application"** by Muhamad Akmal Bin Zakaria, the author found that there is some problem in term of type of smartphone usage among students. There are various types of smartphones with different operating system produced by Samsung, Apple, Microsoft, Blackberry, Nokia and others. The attendance system was purposely developed for Android phone at first. However, not all students are using Android phone thus they are not able to connect with the lecturers' apps.

1.3. Objective of Study

The objective of this project is to develop a new student attendance tracking system that able to replace the previous system. The system will have the following functions:

- Able to track student who attend the lecture session.
- To use new technology that become current trend in UTP community
- To use fully online system to replace the manual way of tracking student in class.
- To identify any other option or method use to establish the tracking system.
- To help lecturer in managing the database of the students' attendance electronically.
- *To enable non-Android students to connect with lecturer's Android apps*.

1.4. Scope of Study

The scope of study is the requirement need to be fulfilled in project development. Project need to have the positive impact to it surrounding during its implementation. Hence, this project only focuses on:

1.4.1 Bluetooth connection between devices (Phones with different OS)

This attendance system is developing by only focusing on Bluetooth technology. The others attendance system that had been developed was using radio frequency identification technology (RFID), near field communication technology (NFC) and Wi-Fi technology. However, the author found that Bluetooth is the most suitable technology to be implemented in UTP community as most student have their own mobile phone and mobile phone nowadays are equipped with Bluetooth function.

1.4.2 Develop for UTP community to increase the efficiency and effectiveness of UTP attendance system.

The target audience of the attendance system is UTP community. This system is just for UTP's lecturers to track and record the attendance and presence of their students in every particular lecturer session.

1.4.3 Database for lecturers to keep track students attendance.

MyPHPadmin database is set up by the author for lecturers to keep all the attendance records of their students.

1.5. Project Feasibility

The system need to be developed within the time frame and available resources in UTP.

- System can be developed based on current knowledge and experience of the author after 4 years of learning throughout UTP.
- System can solve the problem and issue regarding UTP students' attendance.
- Prototype can developed and run within the time frame given.
- Bluetooth technology and Android is available.
- Enhancements from previous project enable all UTP students to use the system.

CHAPTER 2
LITERATURE REVIEW

2.1 Transforming Attendance System

A study has been conducted by Budi (2009) about considering several factors of migrating manual attendance system. Firstly, the author mentioned that the most common way used to monitor one's presence at a place is by using signature on a paper while in a company, the clock machine is use to check the presence of employees. Secondly, he highlighted that the presence of students in education institution are checked according to the signature of students on the attendance sheet. Sometimes, lecturers need to call or check their actual presence in the class and this process is time-consuming and less effective and efficient.

Why attendance of the students is so important? Yao and Chiang (2011) mentioned that there was strong correlation between absence from the first day of class and overall result. Usually, for those students who did not come for the first class of a particular subject, he/she might lose many important details and information for entire semester. In other paper, Brouchek and Bass (2011) stated that GPA is significantly correlated with attendance. We could see this even in UTP where there are differences in term of GPA between students who always attend the lecture session and vice versa. The students with lower attendance rate usually get lower GPA compared to students who fully attend all the session.

Therefore, education institution cannot easily take the attendance issue for granted as it may affect the performance of the students and university as well. This matter needs to be taken seriously and they need an automated system to avoid any misconduct if it is less monitored.

2.2 Bluetooth Technology

Based on the previous project, Akmal (2013) had mentioned that Bluetooth is a wireless technology standard that allows two or more parties exchanging data over the short distance. Basically, this technology use short-wavelength radio transmissions of ISM band from 2400 till 2460 MHz. This technology allows the two devices to communicate through the personal area networks (PANs). Other than that, Bluetooth is the example of the network technology that establishes the high level of security.

2.2.1 Use of Bluetooth

Bluetooth widely used as a medium for 2 users to exchange the information and data via radio wave transmission. There are few example of common use of Bluetooth in daily life such as:

- Embedded in PC, mobile phones, tablets, and other computer device to allow the exchange data between users.
- Allow communication between mobile phone and hands free headset.
- Allow communication between mobile phone and Bluetooth compatible car stereo system
- Intercom
- Bluetooth mouse, keyboard and printer.
- GPS equipment
- Replacement of gadget used of infrared
- Cable-free devices such as USB.
- Gaming console such as PlayStation 3, PSP Go, Nintendo's Wii.
- Real-Time location systems (RTLS)
- Personal security application in mobile phones.
- Canada's Road Traffic division.

2.2.2 Bluetooth device operation

As per discussed in the previous project, Akmal (2013) stated that Bluetooth device in discoverable mode will transmit device name, device class, list of services, and technical information via radio waves.

In the process of pairing the Bluetooth devices, connection between 2 devices begin when user need to perform pairing process. Once the pairing processes occur, the devices will bonding and enable the devices to connect in the future. These processes involve the user interaction as to maintain the security issues.

While in the implementation process, the 2 devices create a shared secret known as a link key. Link key used to determine whether both devices paired or bonded. Devices can communicate to each other by generating cryptographically authenticate via key link.

2.2.3 Relevancy of Bluetooth with project

As the author proposed, the project will use Bluetooth as the main technology. Other than that, the system will be developing by using Android application. The main reason is the system is easy to be used in Android. Most of smartphones are using Android OS.

However, the attendance system that will develops by the author also enable non-Android phone to connect with lecturers' Android device. Nowadays, majority of the phones (smartphones or not smartphones) are built in with Bluetooth technology. Hence, the non-Android users will send identification to the lecturers' Android apps via Bluetooth since not all phones are equipped with Wi-Fi.

The reasons why the authors choose Bluetooth instead of Wi-Fi in developing the attendance system in UTP are low cost, low power consumption and can be used to connect up to seven devices at a time. Since this system will develop for mobile phones, it is better to use Bluetooth as mobile phone is the primary device of Bluetooth. Below are the table of differences between Bluetooth and Wi-Fi.

	Bluetooth	Wi-Fi
Frequency	2.4 GHz	2.4, 3.6, 5 GHz
Cost	Low	High
Security	It is less secure	Security issues are already being debated
Primary Devices	Mobile phones, mouse, keyboards	Notebook computers, desktop computers, servers
Hardware Requirements	Bluetooth adaptor on all devices connecting with each other	Wireless adaptors on all the devices of the network, a wireless router
Range	5-30 meters	Typical range is 32 meters indoors and 95 meters outdoors
Power Consumption	Low	High
Ease of Use	Simple to use. Can be used to connect up to seven devices at a time	More complex and requires configuration of hardware and software

Table 2.1: Differences between Bluetooth and Wi-Fi

2.2.4 Bluetooth Connectivity Feasibility for Android and non-Android Devices

The Android platform allows a device to wireless exchange data with other Bluetooth devices with support for Bluetooth network stack. Through the Android Bluetooth APIs, the application frameworks provide access to Bluetooth functionality and these APIs allow applications wireless connects to other Bluetooth devices. It also enables point-to-point and multipoint wireless features even to non-Android Bluetooth devices.

Below are the capabilities of Android application by using the Bluetooth APIs:

- Scan for other Bluetooth devices
- Query the local Bluetooth adapter for paired Bluetooth devices
- Connect to other devices through service discovery
- Transfer data from and to other devices
- Manages multiple connections

The entire above task will be used in UTP Attendance System in order to connect and transfer data from non-Android devices to lecturer's Android application. Android Bluetooth APIs is able to accomplish for major tasks needed to communicate using Bluetooth.

The tasks are setting up Bluetooth, finding devices that are either paired or available in the local area, connecting devices, and transferring data between devices. All of Bluetooth APIs is available in the *android.bluetooth* package.

2.3 Related Work

It was found that there are a few numbers of other researches on student's attendance tracking system. These other attendance system however have different ideas on how to get the attendance of the students efficient and effectively. In this case, it shows that students' attendance tracking system could be the way to solve the problem or issue regarding presence of students in lecture session.

The first research paper explained on development of attendance management system using biometrics. This was done by O. Shoewu and O.A. Idowu from Department of Electronic and Computer Engineering, Lagos State University, Epe Campus, Nigeria. This project was done in 2012 and the authors have mentioned that an automatic attendance management system using biometrics would provide the needed solution for attendance issue. Rather than signing an attendance sheet, individuals will pass their thumb over the fingerprint scanner, the finger print is compared against a list of pre-registered users, and once a match is made, the individual will be registered as having attended that lecture. Basically, the student's biodata and the fingerprints are enrolled first into the database. The fingerprint is captured using a fingerprint device.

On the other hand, the other paper was about an attendance monitoring system in classroom using RFID technology. This attendance system research paper was authored by Rajen Patel, Nimisha Patel, and Mona Gajjar from Department of Computer Engineering, Sankalchand Patel College of Engineering, Visnagar-384315, Gujarat, India. The research work started in 2012. The proposed architecture that described by the authors is it consist of hardware and software components such as readers, tags, middleware, database server, application server, hosts and local area network infrastructure (LAN). All RFID readers are mounted in the central of each class room and connected with existing campus LAN infrastructure. All students and faculty members' identity card converted with RFID tag. Software running on application server receives events, which having tag id, date, time, and class room location etc. This information passes through middleware which provides the filtering operation. The authors also had done some study on comparison between RFID, Biometry and others automatic identification approaches.

The table below shows the comparison between differences automatic identification technologies.

System Parameters	Barcode	OCR	Voice recog	Biometry	Smart card	RFID
Data quantity	1–100	1–100	--	--	16–64 k	16–64 k
Data density	Low	Low	High	High	Very High	Very High
Machine readability	Good	Good	Expensive	Expensive	Good	Good
Readability by people	Limited	Simple	Simple	Difficult	Impossible	Impossible
Influence of dirt/damp	Very high	Very high	--	--	Possible	No influence
Influence of (opt.) covering	Total failure	Total failure	--	Possible	--	No influence
Influence of direction and position	Low	Low	--	--	Unidirectional	No influence
Degradation/wear	Limited	Limited	--	--	Contacts	No influence
Purchase cost/reading electronics	Very low	Medium	Very high	Very high	Low	Medium
Operating costs	Low	Low	None	None	Medium	None
Unauthorized copying/modification	Slight	Slight	Possible (audio tape)	Impossible	Impossible	Impossible
Reading speed (including handling of data carrier)	Low ~4 s	Low ~3s	Very low > 5 s	Very low > 5–10 s	Low ~4 s	Very fast ~0.5 s
Maximum distance between data carrier and reader	0–50 cm	<1 cm Scanner	0–50 cm	Direct contact	Direct contact	0–5-m, microwave

Table 2.2: Comparison between Differences Automatic Identification Technology

CHAPTER 3

METHODOLOGY

3.1 Introduction

In designing the end product which is the prototype on UTP Attendance System, the methodology used is the combination waterfall model and Rapid Application Development (RAD). All phases in waterfall model is included in RAD but at a compress and intensify rate. Phases involved in RAD are; Requirements Planning, User Design, Construction, and Cutover.

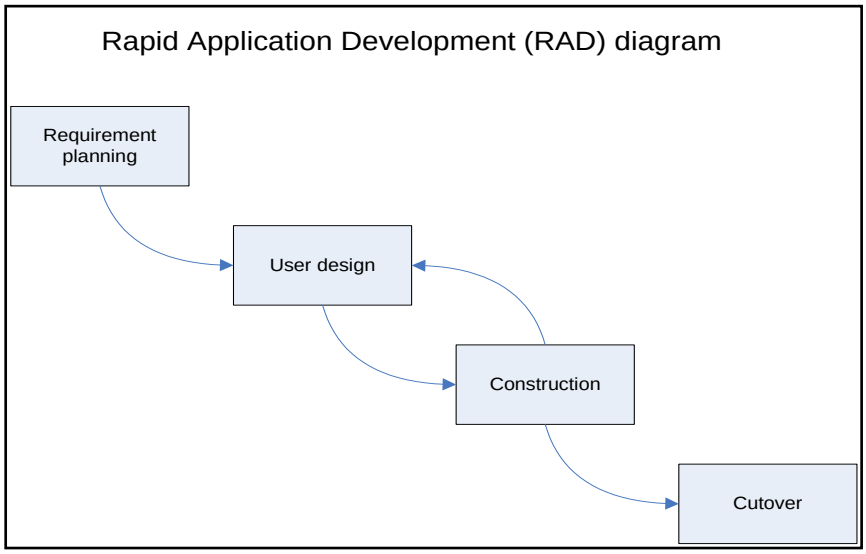


Figure 3.1: Rapid Application Development (RAD) Diagram

Rapid application design is an approach to the developing of the information system that does promise the better and cheaper system with rapid development. RAD put the emphasis on low cost and fast delivery. Based on the diagram in Figure 1 it can be seen that analysis and planning take done before coding is initiated. While design is done after the requirement had been determined. Coding, testing and debugging are done as a whole activity in construction phase and finally if the cutover is the final delivery to the end user.

Therefore, based on the scope and time frame provided, author guarantee to develop a prototype to manifest the system proposed. The main reasons of the selection RAD are because it is iteration process, keep changing based on user requirements, involve the prototyping, and able to be complete within the short-time period.

3.2 Development Phase

Phase1: Requirements Planning

This is the part where the research to develop UTP Attendance System on Mobile Phone will be done. The research will be conducted in three phases. In Phase 1, the research is done to determine the requirements for user-friendly mobile application to track presence of students. While Phase 2 will be is focusing on designing the interface and also designing the interaction between the process and data. Finally, Phase 3 involves derivation and validation of the proposed design. To gather the entire requirement needed, various methods are used for example, detail examines on previous research papers and the outcome from these phases will be:

- Preliminary draft of the storyboard
- Basic knowledge and understanding of UTP Attendance System on Mobile Phone
- Draft of the conceptual framework

Phase 2: User Design

At this phase, there are some collaboration between developer and the supervisor of the project. The discussion involved integrated tools to support the rapid prototyping of system design. Supervisor will recommend some idea on the expectation prototype so that it will successfully assist user to complete certain task. Supervisor and developer will work closely and quickly to create prototypes that capture systems requirements and that become the basis for the physical design of the system being developed. At the end of user design, the outcome should be as below:

- Diagrams defining the interactions between process and data
- Preliminary draft of the interface

Phase 3: Construction

During this phase, the developer who created the design now generates code using the Eclipse. End users also participate, validating screens and other aspects of the design as the application system is being built. Construction can be combined with user design into one phase when developing smaller systems. The outcomes from this activity are:

- Design has been finalized
- The system builds using the Eclipse

Phase 4: Cutover

Cutover is the delivery of the new system to its end users. Planning for cutover must begin early in the RAD process because the RAD approach is so fast. Cutover involves many of the traditional activities of implementation, including testing the system, training users. The outcome from this activity is that the new application will be implemented.

3.3 System Architecture

3.3.1 Use Case Diagram

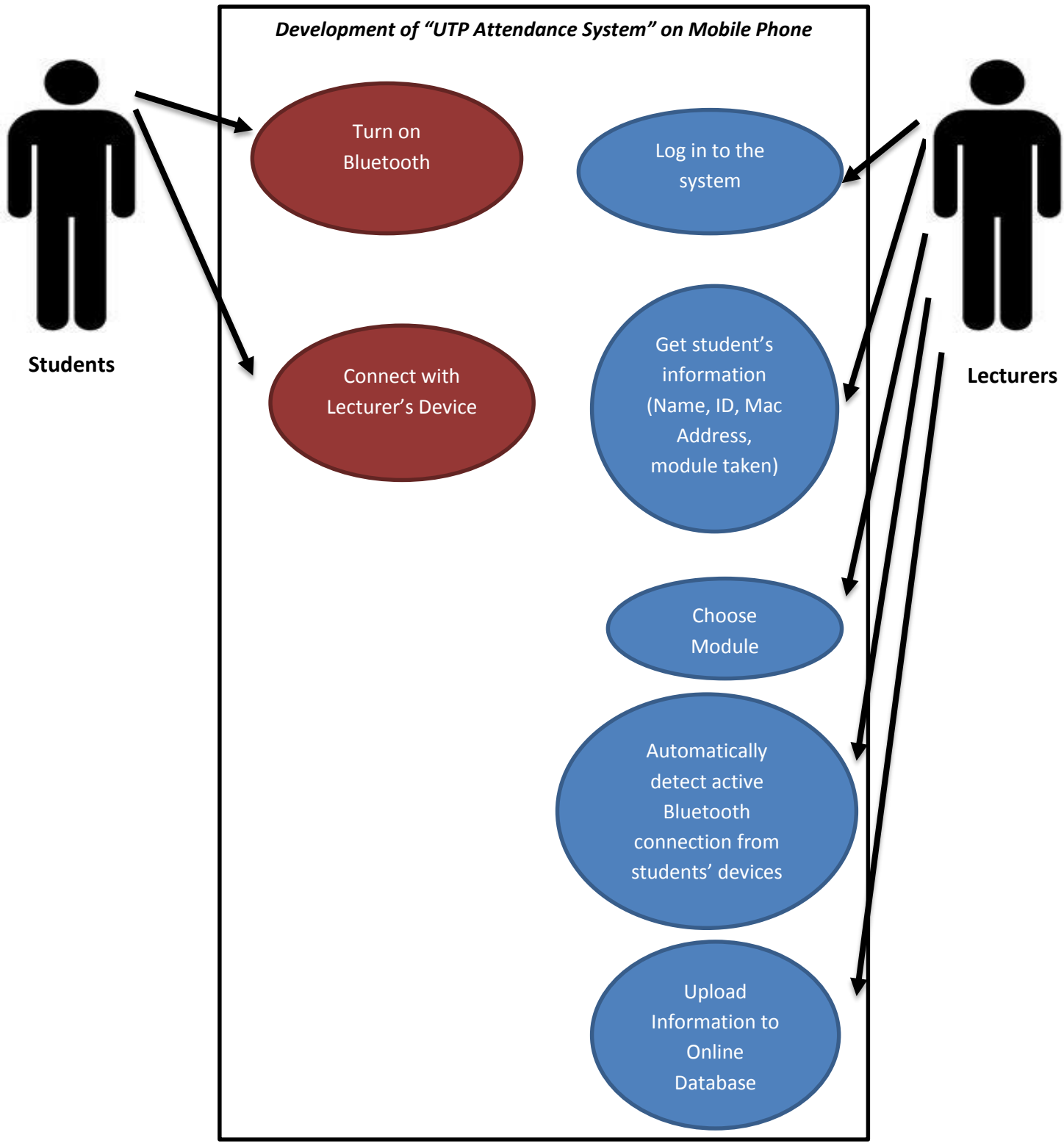


Figure 3.2 Use Case Diagrams

3.3.2 Design Architecture

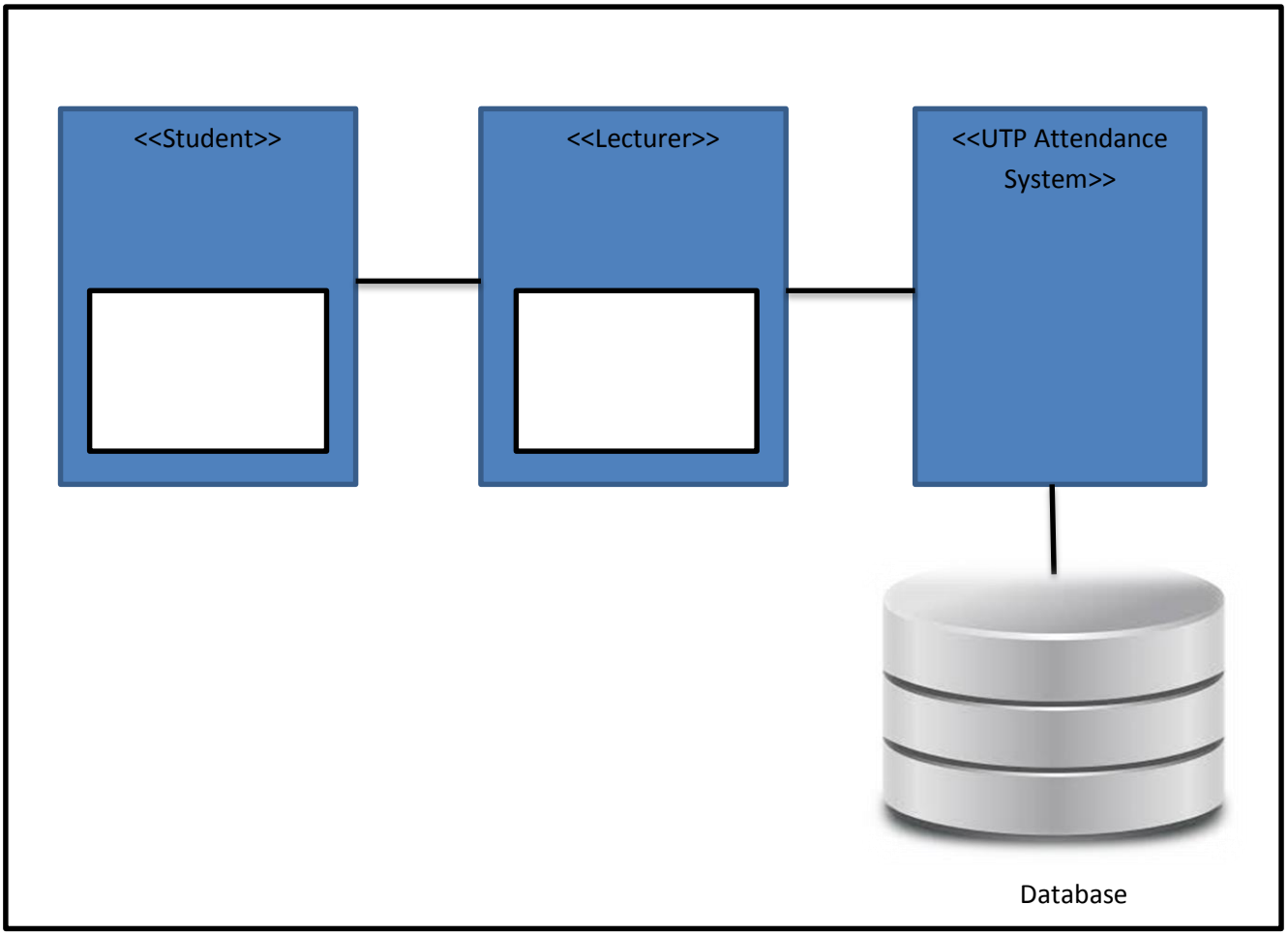


Figure 3.4 Design Architecture

3.3.3 Prototype Architecture

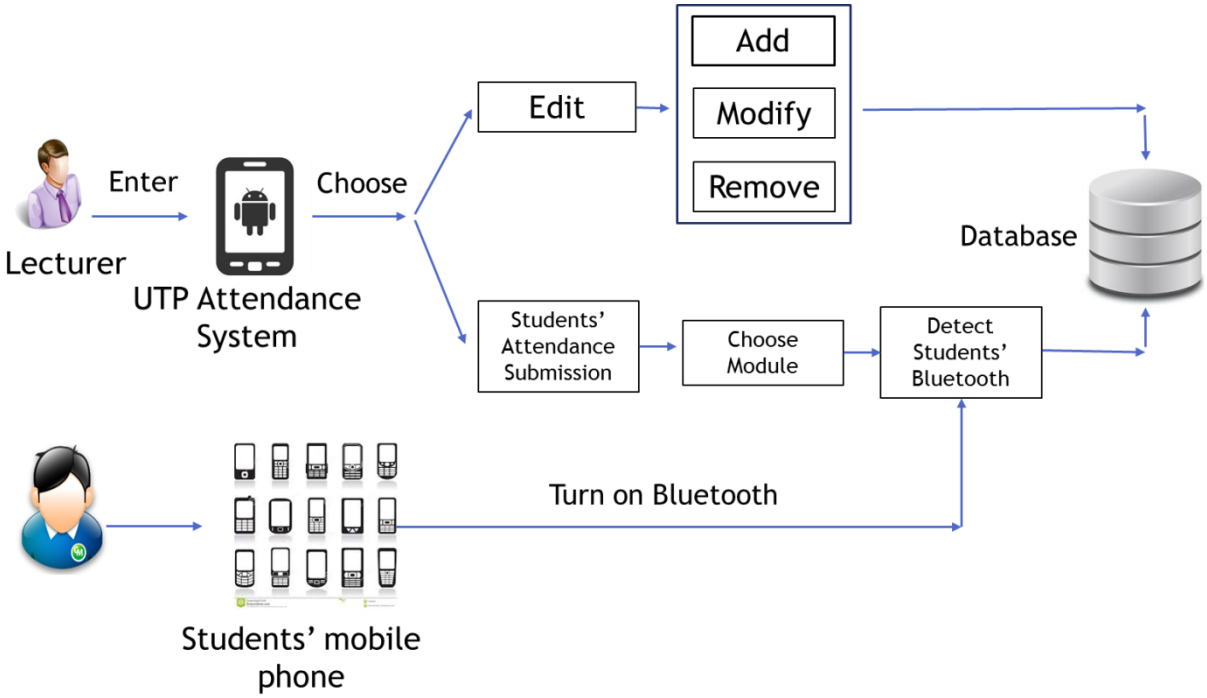


Figure 3.4: Prototype Architecture

Figure 3.2 shows the proposed architecture of the prototype. The flow of this Android application shows it start from lecturer. They need to insert password to log in to the system. Once log in, they are able to choose either Edit or Submit the attendance information. In editing process, system allow user to add, modify and remove information of the students. Once complete editing, the new information will be submitted to database.

In second option, users need to choose their respective teaching module. Then the system wills show the name list of the students and automatically get the active Bluetooth connection from students' device. Once get all the connections, the attendance information of the presence students in lecture session will be submitted to database.

3.4 Study Plans

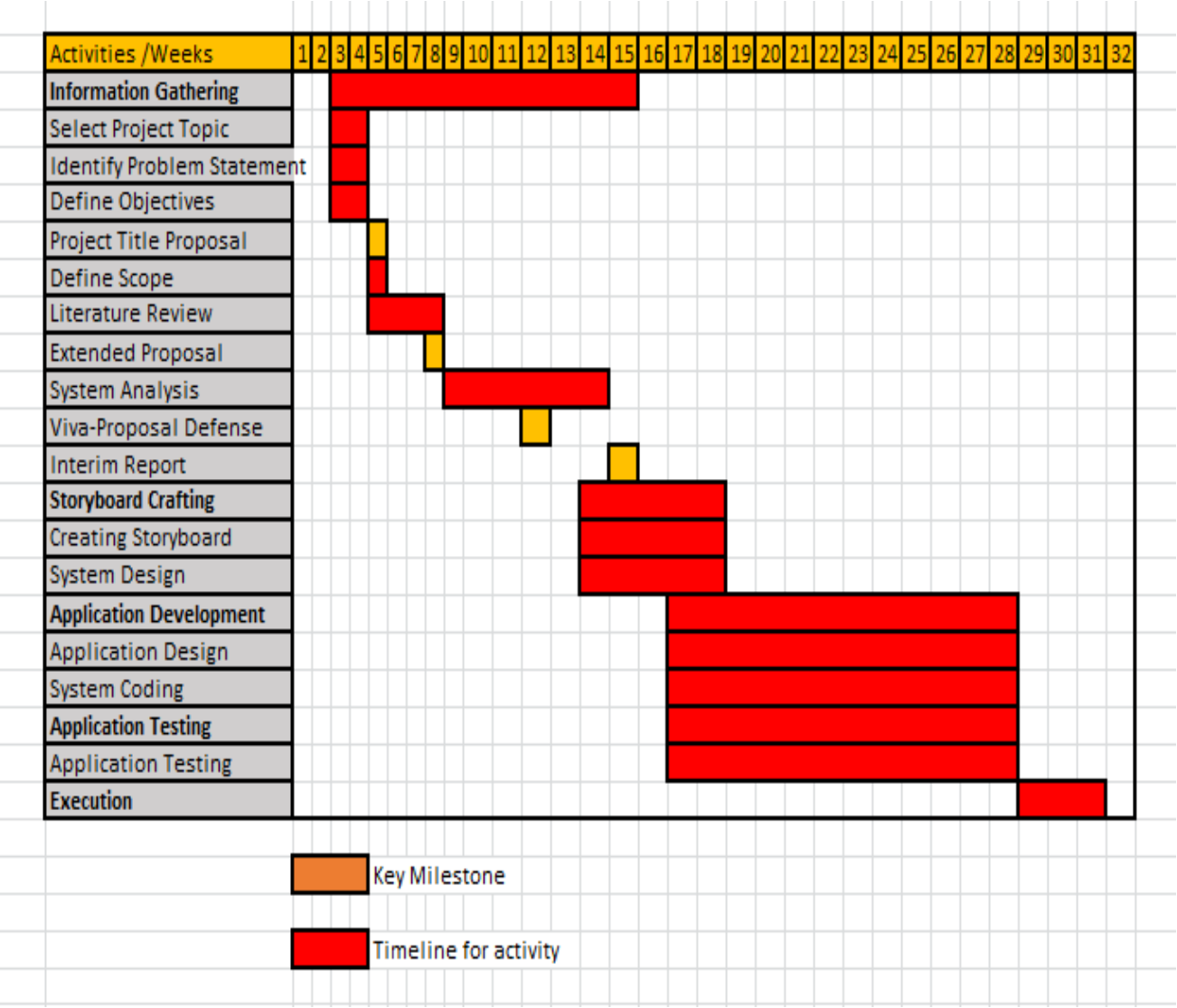


Table 3.1: Study Plan for Final Year Project (I and II)

CHAPTER 4

RESULTS AND DISCUSSION

This chapter explains about the current project implementation. In Section 4.1, the findings of literature review are presented. Next, Section 4.2 explains about data gathering from the UTP community and proceeds to the system workflow which clarifies how the system flow is in section 4.3. Then, Section 4.4 is about the interface/storyboard of the application which shows the flow of the application with the aid of the idea of the interface that would be developed in the near future.

4.1 Literature Review Findings

From literature review research, the findings are:

- Attendance of students to lecture session is crucial as it may affects to performance of both students and educational institution.
- Attendance system needs to be transform from manual system (attendance sheet) to automated system.
- By using technology, there must be a way to get the information about students' attendance effectively and efficiently.
- In order to solve the problems in tracking students' presence in class, UTP Attendance System for Mobile Phone will be a good solution.

4.2 Data Gathering

As to understand the usability of study, acceptance and feasibility of the project, a survey has been conducted within UTP community. The target candidates come from students. The survey was conducted as to understand whether the current system is relevant or need to be replaced for some improvement in tracking students' attendance.

Basically the survey was conducted by having 6 basic questions as to understand the relevancy of the problem statement, scope and objectives of the project. Multi Choice Question was chosen by authors to acquire quantitative data. Below are the questions that had been used to achieve the goal.

4.2.1 Questionnaire:

Background Research: Universiti Teknologi PETRONAS is an established university mainly for technology and engineering graduate. The community of UTP consists of students, lecturers, management, staff and others. As one of rules and regulation to pass a particular course, students are compulsory to attend every lecture session and lab session at least about 80%. Therefore, in order for lecturers to track the presence of their students, they need to distribute a list name that called as attendance sheet and all students will put on their signature on his/her name as the to prove he/she attend that session.

1) **What is the type of mobile phones you used?**
2) **Do your phone is equipped with Bluetooth function?**
3) **Do you think current UTP attendance system is relevant for nowadays education environment?**
4) **Do you think UTP need a new system to replace the current/manual system?**
5) **Do you ever ask your friends to sign on behalf you when you were not attending that particular lecture session?**
6) **Do you agree if new system by using mobile phone as a medium of tracking the attendance?**

4.2.2 Result Analysis

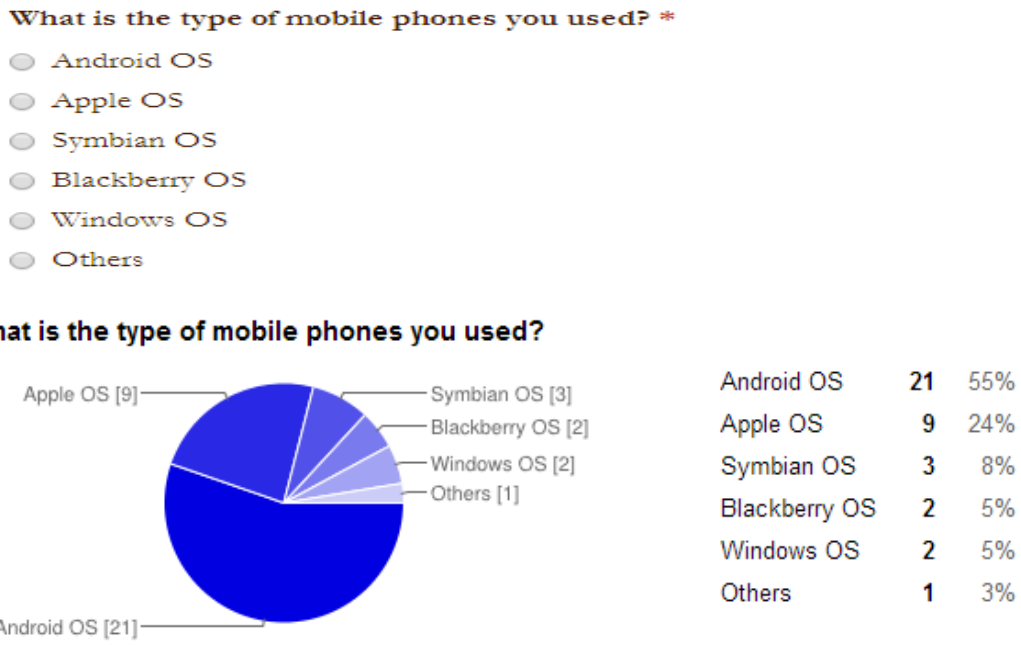


Figure 4.1: Question 1

From the first question of the survey form, author can see the current pattern of type of phone using by UTP students. From the 38 students, 21 (55%) of them are using Android which is the highest percentage among other types of smartphone. Iphone from Apple is the second largest user in UTP by having 24% of the 38 students and followed by Symbian OS, Blackberry OS, and Windows OS. There is only one student who do not use smartphone. As the result shown, UTP community mainstream of smartphone are Android phones.

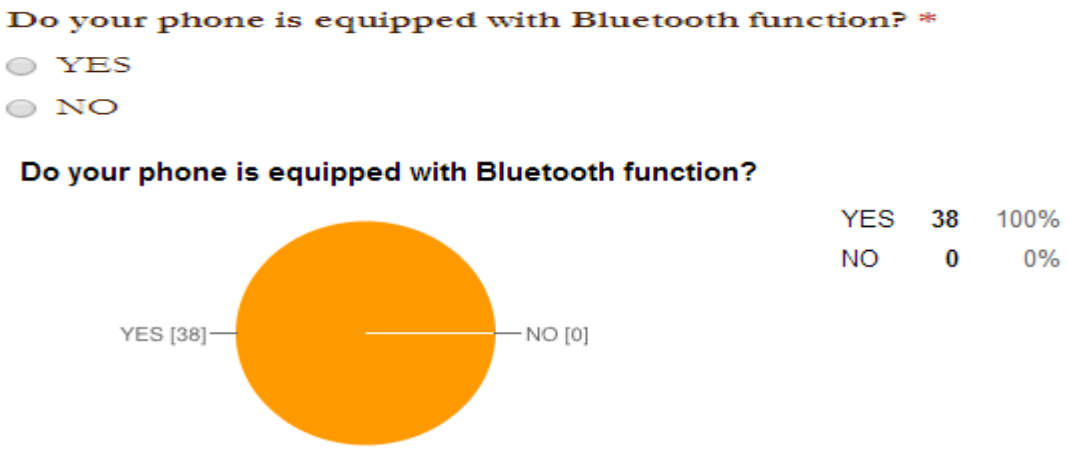


Figure 4.2: Question 2

Based on the above question, all 38 students' (100%) phone are equipped with Bluetooth function. Even though one of the respondent are not using smartphone, but normal phone also nowadays are built with Bluetooth function. Hence, all students are able to use the UTP Attendance System without any restriction.

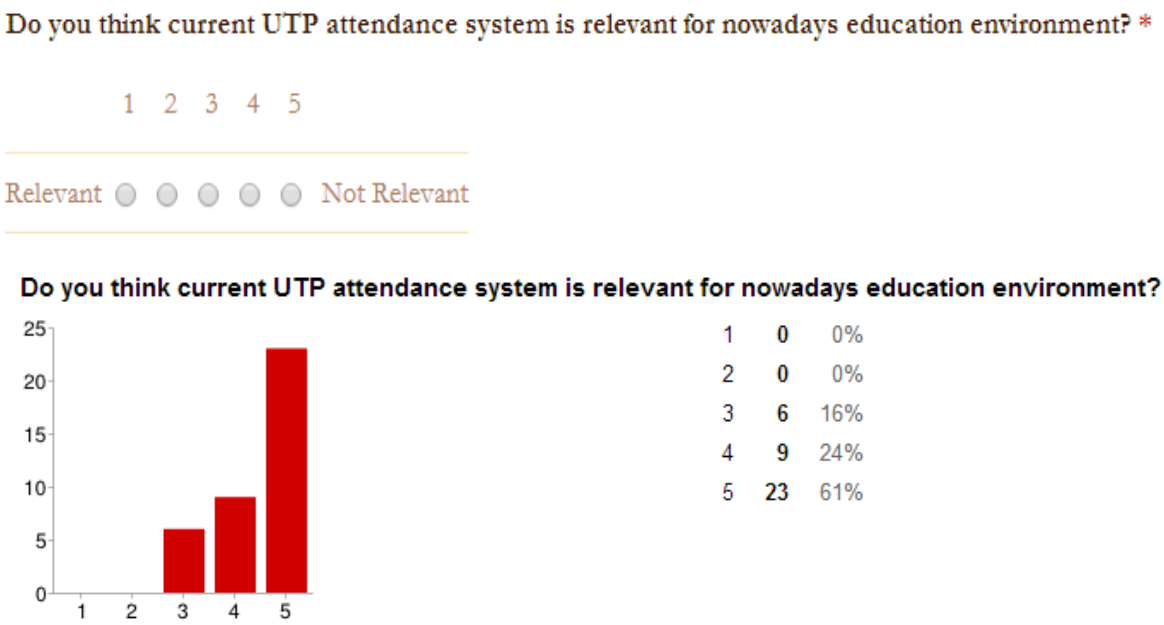


Figure 4.3: Question 3

Based on the above statistic, majority of the students with 61% of them claimed that the current practices of tracking students' attendance is not relevant. However, some of them (16%) are neutral to the issue stated. None of the students believe that the current system use is relevant to be continued. On this statistic, author can conclude that most of the students in UTP realize that the system used in UTP is yet not relevant.

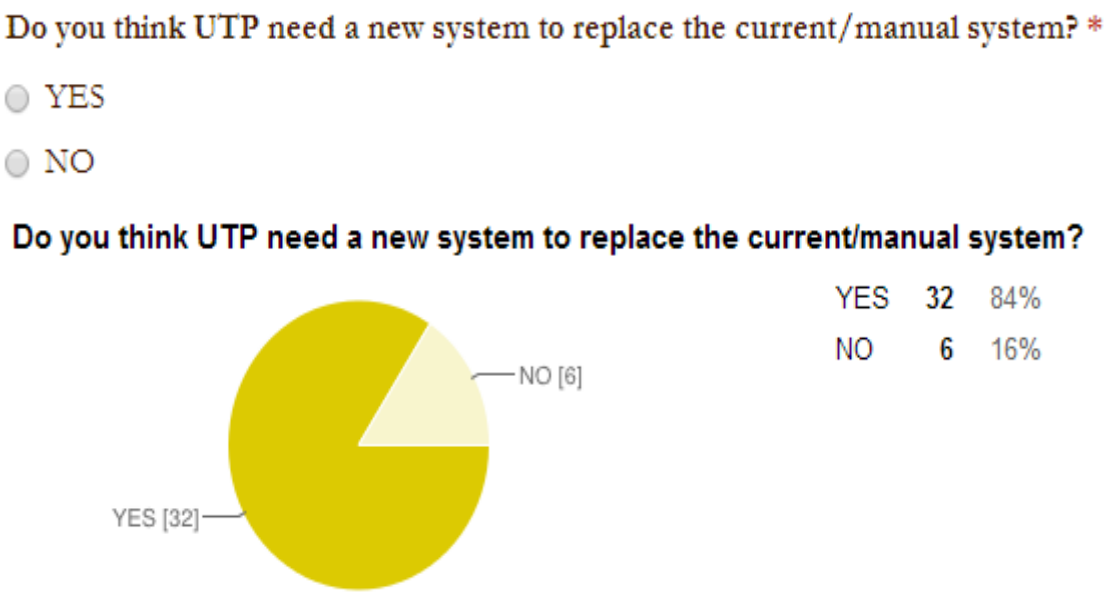


Figure 4.4: Question 4

Based on the survey conducted, 32 out of 38 students (84%) agree that UTP need a new system and method of taking and keeping students' attendance record. There are only 16% of them agree to remain the old system and no need to change the current one. Therefore, author can conclude that new system needs to be used in order to replace the manual system that is just on a piece of paper.

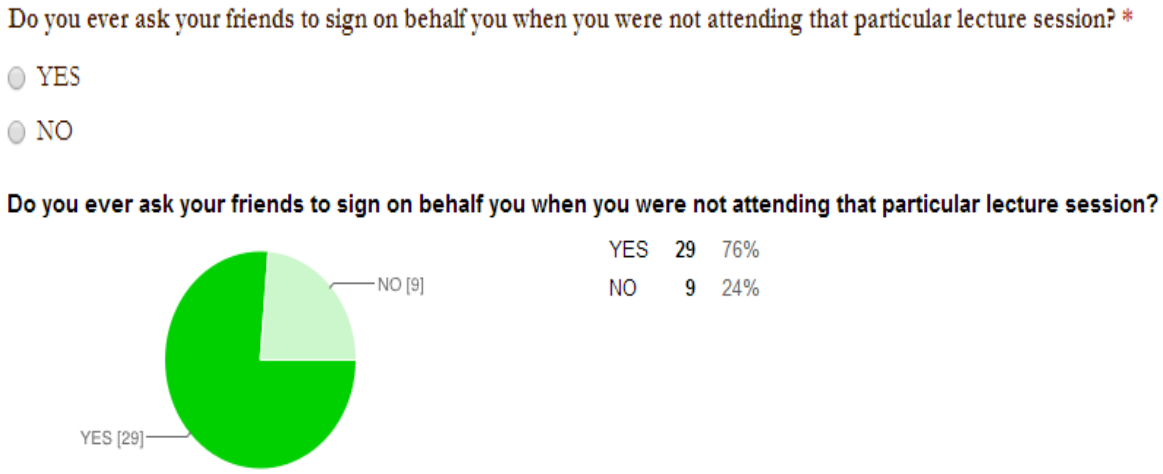
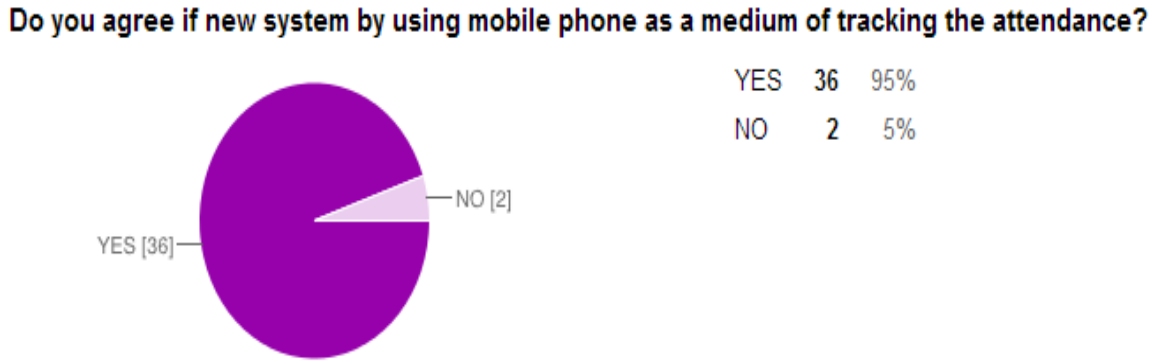


Figure 4.5: Question 5

For the above question, it was purposely included in the survey to study and understand if there are flaws in the current attendance system. In this case, author found that students were tending to commit cheating in their attendance. 29 out of 38 students (76%) had done this within their study period here in UTP. Most of the case happens when students will sign on behalf of their absent friends during lecture session.

Do you agree if new system by using mobile phone as a medium of tracking the attendance? *

- YES
- NO



As the last question of the survey, author gets a very positive feedback from the respondents. 95% of them were agreed that mobile phone can be used as a medium for this new tracking attendance system in UTP. However, there are two students did not agree on this as they believe that current system as much more practical and easy to be implemented.

4.3 Prototype Workflow

This section shows the flowchart diagram of the prototype. The flowcharts of the Android application system are as shown in Figure 4.1.

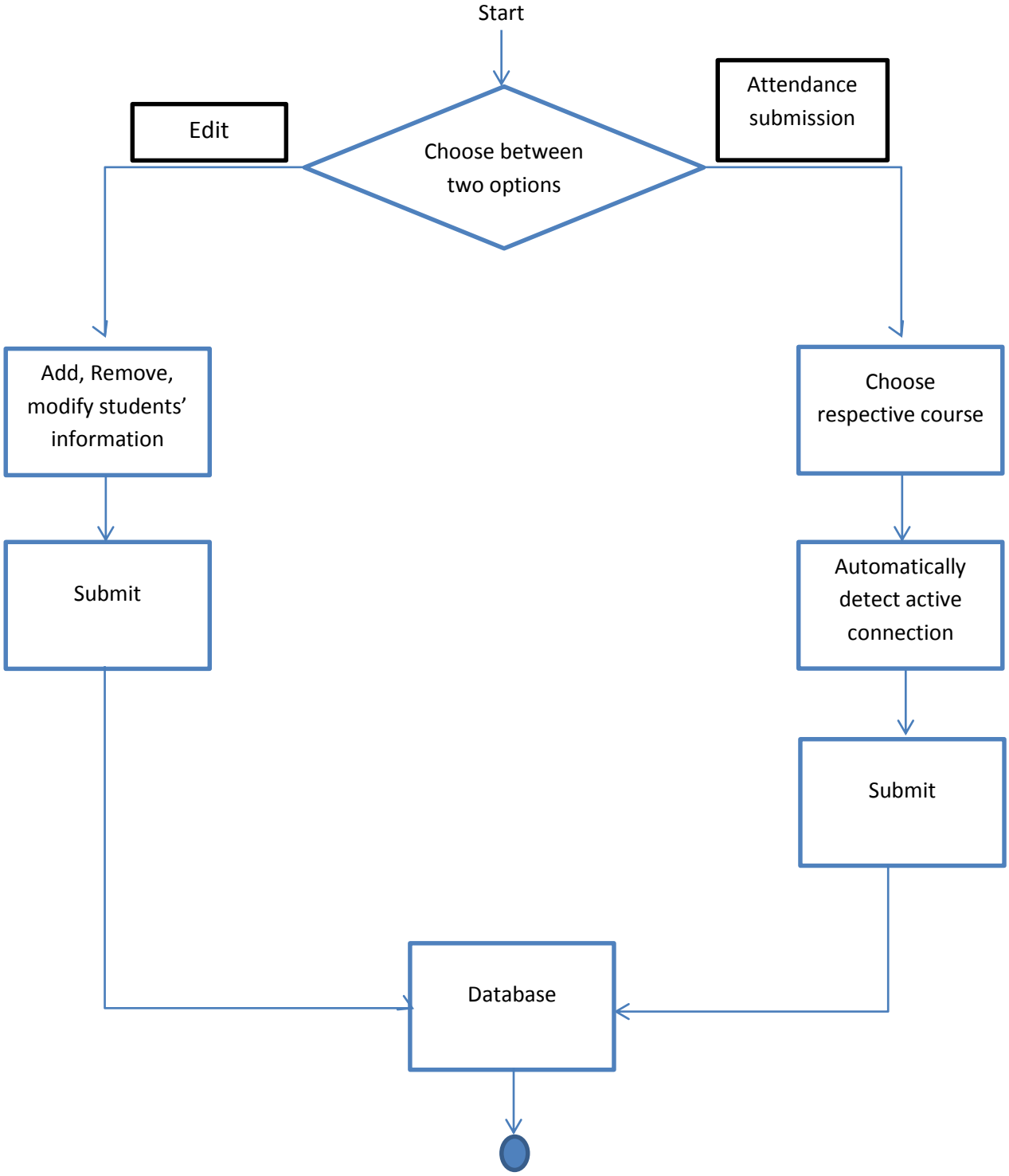


Figure 4.7: Flowchart of prototype

4.4 System Design and Implementation

This chapter will explain about development of the Android application. The interface of the application is shown in Figure is the log in page of the system.

Figure 4.8: Log in Page

As the user (lecturer) enter the Android application (UTP Attendance System), they need to insert correct password in order to log in. If they insert wrong password, they are not able to log in and need insert the password again. Once user succesfull log in to the system, it will bring the user to the home page in Figure 4.8.

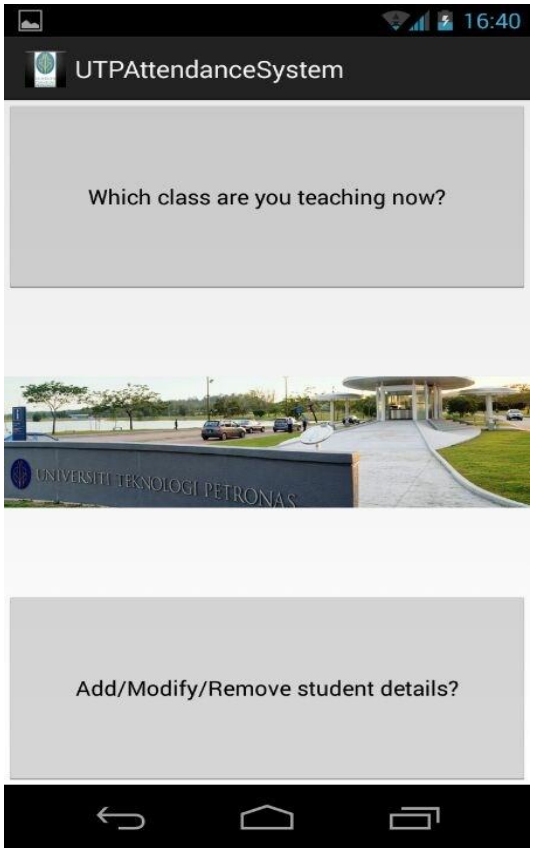


Figure 4.9: Home Page

At this page, there are two options that user can choose. They can either submit the attendance information or edit the students' detail. Basically, in the first lecture session of a particular semester, lecturers need to register new students in the system. Other than add new students, they also able to modify existing students and remove students as well. These functions can be done by clicking on the "Add/Modify/Remove student detail" button.

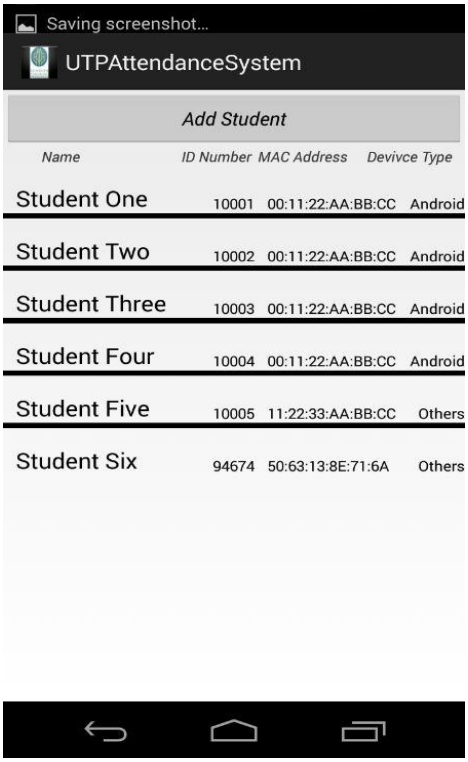


Figure 4.10: Edit Student Page

If users choose the “Add/Modify/Remove student detail” button, they will bring to this interface. The names and the other information of the existing student are listed there. What users need to do in order to modify or remove the existing students is just clicking at the particular student. However, if users want to add new student, they can just click on the “Add Student” button at the upper part of the interface.

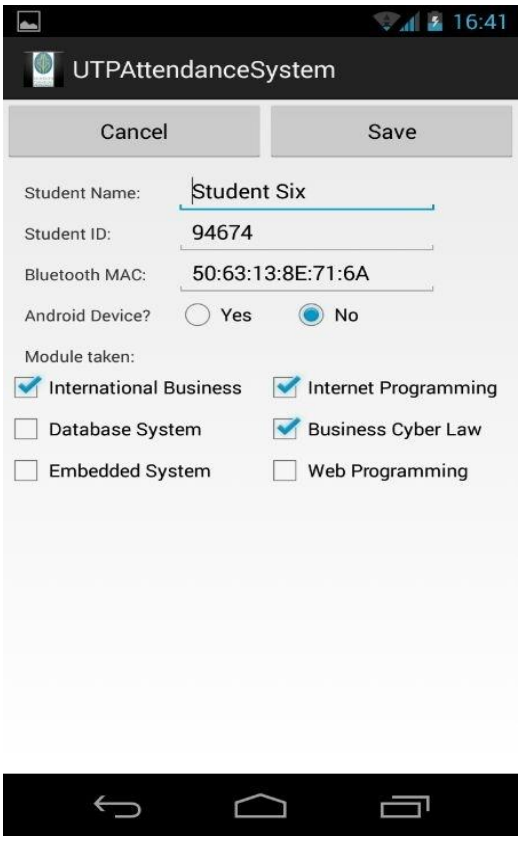


Figure 4.11: Insert Detail Page

This interface will appear when users click on the “Add Student” button. Here user can add new Name, Student ID, Bluetooth Mac address and module taken as well as edit the existing one. For module taken, lecturers just need to tick on the checkbox for each of the module offered. After inserting all the information, just click the save button and all the new information will be stored in database.

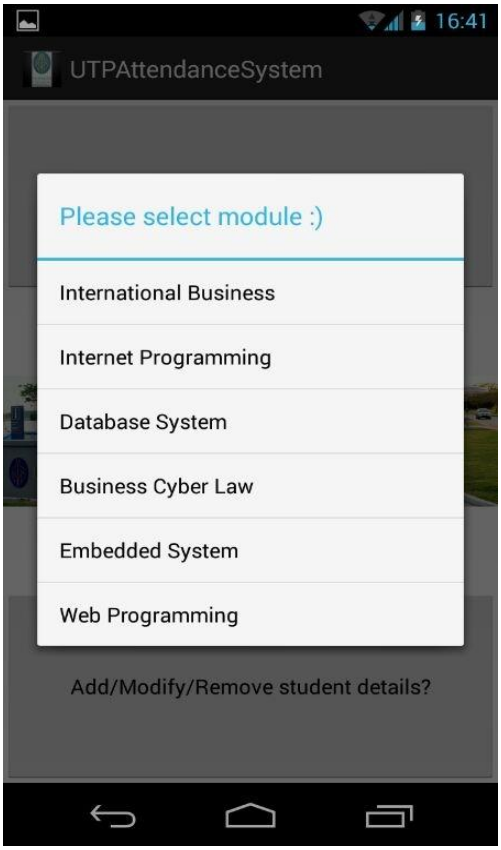


Figure 4.12: Selecting Module Page

Back to the homepage, if users click on “Which class are you teaching now?” button, the system will bring them to this interface (Figure 4.12) where they can choose their respective module accordingly.

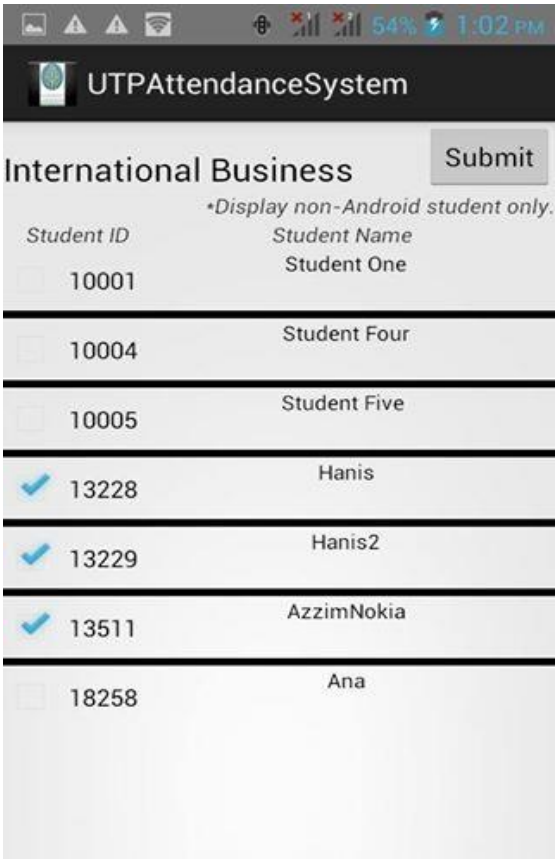


Figure 4.13: Attendance Submission Page

After choosing a module, the system will list down all the students that had been registered for that particular module. At this point, students will turn on their Bluetooth from their mobile phone. Then, UTP Attendance System will detect the active Bluetooth and automatically tick on the checkbox. After receive all connections from students, lecturers just need to click the "Submit" button and the attendance information will be stored in the database.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Referring to chapter 1, in section 1.3, it was stated that this project has 6 unique objectives. It can be concluded that mobile phone can be fully utilized in the future if this system really implemented in UTP. It helps to replace the current system that proven to have a lot of flaws and lack of efficiency and effectiveness. Hence, author strongly agree that by using new Android OS with the assist of mobile phone, the project can give benefit to student, lecturer, and UTP overall. In addition, this enhancement of the previous project will enable all UTP students to be track by the application. Other than that, the online database also helps a lot for lecturer in keeping the attendance records. As a conclusion, this project proposed by the author hope to give good impact to the learning system in UTP.

5.2 Recommendations

There are several recommendations to be made regarding this project. Recommendations are not meant to be used to change this project wholly, but to allow improvements in certain aspects and to put some factors into considerations before proceeding with the development of the application.

Once the project implement into the real environment, it will boosting the performance of student and lecturer in lecture session. Author strongly recommends the project should be continuing as it may change the flow of lecture session and give advantage to everyone. Enhancement also can be made by extend this project to the third user like Registar and Exam unit of UTP in order for tracking barred status since attendance of students is closely to barred issue.

Some other recommendation by author is the utilization of matric card by involves the usage of it in lecture session. For the future expansion of project, Bluetooth system also can be used to track the entrance of student in the UTP main gates. It can actually track the movement of students in and out of campus. This actually can ensure the safety of student. Bluetooth also can be used to borrow book in IRC and many more function.

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